WHAT IS TRUTH?

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PREFACE.

THE following pages contain an address to the Students' Representative Council of the University of Edinburgh, delivered at the request of that body on the 22d of February, 1889.

The chair on that occasion was occupied by Professor A. Campbell Fraser, Professor of Logic and Metaphysics in the University; and it is at his suggestion, conveyed to me in most kind and flattering terms, that it is now published in a separate form.

As it was delivered without having been previously written, I have somewhat expanded certain passages as compared with their spoken form; but even thus I am painfully conscious of the inadequacy of such addresses in dealing with so large a subject.

ARGYLL.

WHAT IS TRUTH?

I.

THERE are few requests more flattering, and few at the same time more embarrassing, than the request which is now so often addressed to public and to literary men, that they should deliver an Address or Lecture, with the usual postscript, "on any subject you please." It is a most flattering request, because it implies a belief that he to whom it is addressed is sure to say something worth hearing, and, perhaps, worth remembering. It is an embarrassing request, because we can never be quite sure that what interests ourselves will be equally interesting to others; or, if a subject of universal interest be taken, whether we can handle it with acceptance and advantage. However, Gentlemen, there is one rule to which I adhere, when I have the honor of receiving any such request; and that is the rule, never to deliver an Address upon any subject which is merely got up for the occasion—always to choose some subject which has long attracted one's attention, and with which, therefore, one can hope to deal to some purpose. It is our duty who address you on such occasions to give

you of our best—to speak to you on matters in which we have been ourselves engrossed, and not to scamp our work by flashy and careless compositions.

It is in pursuance of this rule, Gentlemen, that I have chosen to address you to-night on the greatest of all subjects—one specially fitted for an academic audience—and that is "The Love of Truth"—not as an abstract thesis only, but with special reference to some methods of attaining Truth which I desire to recommend to your habitual adoption. Does it occur to any of you to think that the love of Truth is, after all, a common thing—and that to praise it can be little better than to indulge in commonplace? There are, indeed, some aspects of the love of Truth in which it is common enough. Inquisitiveness—mere curiosity about external facts—this is common to all men. It is common even to the lower animals and to man. Many of the lower animals have strong and instinctive curiosity in respect to any new object or any strange appearance. Whether this curiosity be connected with fear and the apprehension of some new source of danger, or whether it be sometimes nothing more than a vague sense of wonder, it is unquestionably prevalent among the beasts. And very often among men it hardly takes a higher rank. We know by whom it was said that the people of Athens, when their great schools of philosophy had decayed, spent their time in nothing but either in

hearing or in telling "some new thing." But these new things were not necessarily fictions, nor did those who lived only to listen to them take any pleasure in being deceived. But mere gossip, even if it be of a more or less intellectual kind, is but a low and aborted form of the great virtue of which I speak. It is not on the love of Truth, in this sense, that I address you now; neither shall I waste time by speaking of it in the far higher sense of ordinary veracity in our intercourse with each other. I leave to the ministers of the Christian Church the duty of impressing the common obligations of morality in obeying the apostolic precept, "Let every man speak truth with his neighbor." This duty, indeed, may with comparative safety be left to the honorable understandings of society. The standard of opinion and of acknowledged obligation is, in this matter, a higher standard on the whole than in respect to many other Christian virtues. I shall not, therefore, follow the example of a very eminent man to whom I listened in this city, and in your University, now very nearly half a century ago. On that occasion it was suggested to me by an old friend, whose guest I now am in Edinburgh, Dr. William Cumming, of Logie,—whose name may be known to you as the donor of the beautiful fountain which now adorns the Quadrangle of your College,—that we should go to hear the opening Lecture of the Professor of Moral Phi-

losophy. The chair was then held by the celebrated Professor John Wilson—better known, perhaps, as "Christopher North." Of course I knew him well by reputation. I knew his poetry, and especially that Sonnet—one of the most beautiful perhaps in our language—"A cloud lay cradled near the setting sun." I had heard of him as a great critic, and perhaps as an even greater conversationalist. Above all, I had seen him walking in Princes Street, on which his statue now looks down, with that splendid head, those flowing locks, and the powerful countenance which made him at that time the Jupiter Tonans of the Scottish capital. Full of expectation as to the opening utterances of a man so eminent on such a subject as Moral Philosophy, my friend and I repaired to the College. We were surprised to find the class-room with an attendance of the thinnest, and still more surprised when the great Professor appeared, and when we heard him open his course of Lectures with this sentence: "Gentlemen, you must not get drunk." Not addressing you to-night with like advantages of authority, I certainly should not venture to impress upon you such an elementary injunction as that corresponding to my subject—"Gentlemen, you must not tell lies." And yet, I trust, you will not think that I venture to address you on the love of Truth in any sense that is vague, declamatory, or incapable of the strictest logical

treatment. For, indeed, and above all things, I would impress upon you the conviction that Truth is a concept, and a word, which is susceptible of accurate and scientific definition.

Any failure in this conviction must condemn us to hopeless intellectual imbecility. The famous question, "What is Truth?" put by a Roman governor, was a question asked, apparently, not in any mere spirit of taunt or of insult, but in the spirit of utter weariness and despair, which was the habitual attitude of mind in educated Romans at that memorable period of the world's history. It was a period when Philosophy had run its course, and when the wrangling of the schools had left a universal impression that on all the highest subjects of human inquiry nothing was attainable except universal doubt. It is one thing, however, to resign ourselves to inevitable ignorance in respect to many things which we should like to know, and quite another thing to imagine that we do not know what Truth, in itself, is, and means. Our sense of ignorance is indeed, in itself, a witness to the fact that we do know that in which knowing lies. And this can be nothing else but the conscious perception of some Truth, whether it be truth of a fact, or the truth of an inference or opinion. Moreover, since the time when Pilate's question of despair was put, events have happened—the most memorable in the history of the world—which have given pre-

cision to our conceptions of that in which Truth in itself consists. Ideas upon this subject, coming from a higher source than mere speculative philosophy,—but which shine with such inward light that speculative philosophy has been content to adopt them as her own,—have now established a standard and a principle of recognition by which the quality of Truth has come to be well recognized and defined. Those of you who study metaphysics under the able guidance of our distinguished Chairman, may probably have heard of a recent writer whose "History of Philosophy" has some value, and whose analysis of Aristotle's scientific writings is certainly a book of great interest.* I refer to the late Mr. George H. Lewes. He is an author with whose special opinions I have little sympathy, and assuredly no man ever approached such subjects from a point of view more absolutely independent of everything like authority. Yet this writer has given a definition of Truth in which, as it seems to me, we can all concur. "Truth," he says, "is the coincidence between the external and the internal order." Of course this is an outline which requires to be completed. It is a skeleton to which flesh and sinews must be added in order to bridge over the hollows, and to fill up the great spaces which it leaves enclosed, indeed, but

* "Aristotle: A Chapter from the History of Science," 1874.

empty. Of course we must follow up this suggestion of an "order" by asking what that order means. There is, however, no doubt about the answer here. The "order" referred to is an order of thought—that kind of order which is perceptible by the human intellect, and which is related to it.

And now we see the power of the definition, and its high significance. It affirms that Truth consists in the coincidence between that order of thought which is within us, and that other order of thought which is in the world outside of us. When once we have got hold of this idea, we can express it in many ways. We may say that Truth is "the coincidence of thought and feeling with the facts and laws of nature"; or again, that it is "the conformity of our intellectual conceptions, and of our moral judgments, with the facts and laws of nature"; or again, that it is "the harmony between the mind that is in us, and the mind that is in external nature."

And here we come at once face to face with another idea of enormous import. For all these forms, and all other possible forms into which we can throw the same conception of that in which Truth consists, involve of necessity the further conception that Truth is accessible to us. They involve the conception that our faculties are so related to all that constitutes the world we live in, that not only can this relation be felt and known, but that in itself it is the only basis

of all thought, of all feeling, and of all knowledge. This is the foundation-stone on which the superstructure of all science must be built. It has been well expressed by Macaulay in speaking of the great burst of scientific inquiry which arose in a well-known epoch of our history. "There was a strong persuasion," he says, "that the whole world was full of secrets of high moment to the happiness of men; and that man had, by his Maker, been intrusted with the key which, rightly used, would give access to them."* Here we have the practical explanation in historical facts of an abstract and an undeveloped but a true verbal definition. The "external order" to which the "internal order" must conform, is only another expression for that system of natural things in which we live, and of which we are part. In recognizing that system to be an "order"—to be what the very word "system" implies—we acknowledge it to be a body of intelligible laws. The more we look into it the more it impresses us with the idea of permanence and stability—not necessarily in its mere phenomena, but in the ultimate causes to which these, and all possible changes in them, can alone be due. We thus see it to be a kingdom which is indeed an everlasting kingdom, and a dominion which endureth throughout all generations. Truth thus again comes before us in the light of a yet higher definition—as the "conscious and in-

* "History of England," vol. i., p. 410.

telligent perception of the laws of that dominion—of our own place in it, and of our own duties under it." And so we are brought up to the level of that highest of all definitions—the definition which is given to us in the most solemn of all prayers, "Thy Word is Truth." "Word," I need hardly tell you, is here used as the only representative in our tongue of the Greek word "Logos"—a word having that far wider sweep of meaning which we can only indicate by some such phrase as the Divine Reason. This is the full meaning—and the only adequate meaning—of the somewhat bare and naked formula of an "internal order" corresponding with an "external order." It reveals Truth to us in the thoroughly satisfactory conception of a correspondence between our own Reason, so far as it can go, and that universal Reason which animates the Cosmos in which we live. Whether, therefore, we think of Truth in the light of Philosophy or in the light of Religion, we reach two grand and most comforting convictions—the first of which is—that Truth is by us definable; and the second of which is—that Truth is to us accessible.

II.

And now, Gentlemen, I come to the more practical part of my address—to the counsel which I would venture to give you in this great quest of our ra-

tional life, the quest of Truth. I can give you th sum of it in a single sentence—in your search o Truth learn above all things to use the great weapo of Analysis. We need it much. We are being per petually imposed upon by words and phrases. Thi deceptive power is almost omnipresent. In question of government—in questions of philosophy—in ques tions of religion—we are their prey. We know tha analysis is the one all-powerful instrument of researcl in the physical sciences. You will find it not les powerful in casting light on the operations of th mind itself. I can speak from my own—and that long—experience. If there has been the slightest jus tification, Gentlemen, for the step you have taken i asking me to address you to-night—if anything have ever written or spoken has been of the least us to any one in dealing with the great problems of life it has been due to an instinct which I have had fron my earliest years to examine and analyze the word ing of every proposition which is presented to ou acceptance. I recommend this habit to you, witl confidence, as the most fruitful of all habits of th mind. Look closely into the words and phrase which rise almost unconsciously to your lips whe you are speaking to yourself—to those which yo use when intending to convey thought to others, an which others use when they profess to be conveyin thought to you. You will constantly find in thes

words and phrases a perfect tangle of confusion, an abounding source of self-deception.

This is a very old subject. Almost all men who have turned their intellectual powers with vigor and originality upon any subject of difficult investigation, have found reason to complain of the power exercised over the understanding by the ambiguities of language. No man has done so more urgently than that great writer, Bishop Berkeley, whose works have been rendered so happily accessible to us in the admirable edition, and by the luminous annotations, of our Chairman, Professor Fraser. It is not necessary to accept Berkeley's philosophy in all its parts—to be pure Idealists in the form which Idealism took in his hands—in order to appreciate the brilliant and the now accepted light which was cast by his powerful analysis upon some most obscure subjects, both of physical and metaphysical inquiry. It has been said of Bishop Berkeley's "Theory of Vision," that he is the only man who has ever made a great physical and physiological discovery by purely metaphysical reasoning. And so we ought to listen when we hear him saying, "Words have ruined and overrun all the sciences";* and again, when he goes even the extreme length of saying, "If men would lay aside words when thinking, 'tis impossible they should ever

* Berkeley's "Works," vol. iv., p. 450. Clarendon edition.

mistake—save only in matters of fact";* or again, when he repeats as the evident result of his own experience, "to view the deformity of error we need only undress it"—that is, deprive it of its verbal disguises. "And so," as Professor Fraser says, "we find him bracing himself to find an enemy even in the common phrases of mankind."† Yes, they are indeed our enemy—but only when wrongly used. For, on the other hand, they are friends—the most instructive of all friends—when they are used aright. I often think that we may well address to Truth—so often obscured and buried under the heaped-up fallacies of speech—the apostrophe addressed by Tennyson to the slandered dead:

> Wild words wander here and there,
> God's great gift of speech abused
> Makes thy memory confused.

But when the memory of Truth has been redeemed—when by analysis the true force of words has been recovered and revived—then indeed we find that every detected error is a discovered truth. New light streams in through windows which had been closed against the day, whilst spaces and passages of thought innumerable, which had been slippery and dark before, are seen and felt to be ever opening up new

* "Berkeley," by Prof. A. C. Fraser, p. 13.
† Ibid., p. 12.

avenues of suggestion, and to be affording in them firm and solid ground for our advancing steps.

Nor is there any mystery in this, for indeed it must be so when we think what Language is. You have heard, no doubt, of that very eminent man, Professor Max Müller, who has been lately lecturing in Scotland, and whose doctrine is that Thought and Language are identical. I cannot agree with him in this —because it seems to me quite certain that we all can, and that we often do, think of things, and of abstract conceptions, when we cannot recall their names. He says that no concept can be clearly formed until it has first been named. I venture to affirm, on the contrary, that no concept can be named until it has first been formed in the mind. It seems to me that we habitually think in images and not in words—we think of some representative sight or sound, rather than of any articulate syllable or sign. But after all, there may be little importance in this dispute, if we are agreed that Language is so far separable from Thought that we have much need to watch it, lest it should corrupt and deceive our understanding. Whatever be the exact definition of its true relation to Thought, it is near enough and close enough to be in danger of exercising a dangerous influence upon its ally. There can be no difficulty in finding more than one expression which conveys at least some essential aspect of the relation in

which Language stands to Thought. Bacon says it is the "conveyance" of Thought: it may also be called the "vesture" of Thought, the "embodiment" of Thought, the "expression" and the "record" of Thought. And of all its functions this last—that of recording the steps of Thought—is perhaps the most important. In yet another point of view it may be said to be the "coinage" of Thought—stamped with its image and superscription, and specially endowed with all the tremendous powers which belong to one sole—one only possible—medium of exchange. The grand mystery about Language is that it is automatically developed. It grows: it is not invented. It is generated: it is not made. But the place and office of Language is to be the servant of Mind, and it is an usurpation when words become our master. Yet this is the danger—this is what mere words and phrases are perpetually tending to become. The only remedy for this is to be as perpetually turning on Language the legitimate master's eye—the eye of Thought, the lamp of self-consciousness. We must watch over the unfaithfulness to thought with which we allow ourselves to make use of words. This is what I mean by analysis. And here let me say that it is needed not only for the purpose of keeping down Language from usurping the place of Thought, but quite as much for the purpose of keeping up Thought to the high level of those most true, most

subtle, and most various intellectual perceptions which are involved in Language. For in its capacity of the automatic Record of Thought in all past generations, Language is full to overflowing with suggestions and analogies which, very often, we handle blindly without seeing their subtlety or their power. And yet this process of analysis is, in principle, a process of the simplest kind. For when I speak of the analysis of Language I do not speak of Etymology—that science which deals with the historical connection between certain sounds and particular ideas. This is a separate subject—a great subject,—although apt to be very dry, and not less apt, perhaps, to be very fanciful. But it is a difficult subject requiring great learning and much study to be prosecuted with success. I am speaking to-night of something far more simple and far more accessible—namely, the process of breaking up words and phrases for the purpose of seeing distinctly—not what they may have come from, but simply what they do now actually mean. The work which I recommend to you is not to search after anything which is speculative or theoretical, but to search after a simple matter of fact. It is purely, so to speak, a laboratory work. "What are the elements contained in this substance?" is the question which the chemist puts to himself in conducting the analysis of any lump of matter, and it is precisely the same question which we

must put to ourselves in conducting the analysis of a word. "What are the ideas—the conceptions—present in this word—explicitly or implicitly involved in its use?" It is purely a question of fact. Many men do indeed impose on familiar words some arbitrary meaning or artificial definition of their own—from which they can slide by unconscious passages to the commoner significations, and thus between the two, can impose unperceived the most deceptive interpretations on their own mind and on the mind of others. This is not the kind of analysis which I would recommend to your adoption, although it is one of the many sources of fallacy which genuine analysis will reveal. The value of true analysis lies in taking words in their ordinary acceptations—as they are actually used by ourselves, and by other men—in discriminating and identifying the various elements of meaning which go to make up their signification as a whole. The result of such analysis ought not to be any matter of doubt, or of mere opinion. It ought to be a matter of indisputable fact—appreciable by all who are capable of those processes of thought by which alone we can recognize the various ingredients of thought which enter into our own intellectual conceptions.

But here let me sound one note of warning. Although this kind of analysis is in its nature simple, do not run away with the idea that it is therefore

easy. That which, in words, you are called to analyze is, in fact, yourselves. It is the working and operations of your own minds that you have to break up—to divide—to test. Introspection is your only weapon. You have to trace, to pick out, and drag forth into the light of consciousness the separate threads of Thought which have been woven unconsciously in the silent looms of your own automatic mental faculties. This is not always an easy thing to do. Pure introspection is to all men a difficult—to many men almost an impossible operation. Lange, the German author of an interesting work on the History of Materialism, has said with perfect truth: "external things lie nearer to the natural consciousness than the Ego." This is not only true, but it is a most practical and important truth.

There is nothing so withdrawn from our natural observation as the world within us. And of this there is a curious illustration in one well-known historic fact—which has always appeared to me as a great parable. Man had discovered the constitution of the solar system, and the circulation of the planets, before he had discovered the constitution of his own body, and the circulation of his own blood. Let us just consider for a moment what this implies as to the comparative inaccessibility of ourselves to the observation of ourselves even as regards our animal structure only. Ever since our race was created, every

man, woman, and child has had within it an engine working at the rate of from 60 to 70 strokes per minute. Taking it at the lowest of these figures, which is below the average, the strokes of this engine amount to 3,600 in the hour—to 86,400 in the day—to 30,736,000 in the year; and at the end of a life of 70 years this pumping-engine has registered the almost inconceivable number of two thousand millions, one hundred and forty-one hundred thousand, five hundred and twenty, beats. Yet for thousands of years, until comparatively speaking the other day in the history of man, he did not know what this wonderful engine inside of him was doing—what work it was performing in the economy of his own organic frame. And so difficult was the work of introspection even in this purely physical investigation, that when the discovery was made, it was not generally accepted or believed. The same law prevails in the realm of mind. We do not see clearly things which are very close. It does seem almost tragic to remember that Harvey was the friend and physician of Lord Bacon, and that neither of those two great men saw anything of each other's greatness. Harvey seems to have thought Bacon a pompous and pretentious writer; whilst Bacon seems to have attached no value whatever to researches which for the first time enabled man even physically to understand himself. All those historical facts are indeed an allegory—well fitted to

remind us how little we really see of the things which are too near for distinct vision, and how this excess of nearness may well reach its maximum in the operations of our own Intelligence.

But this is not all that is to be said upon the difficulties which attend true and sound application of analysis to Language and to its corresponding Thought. There are two great blunders which are often committed in this attempt, which are the source of illimitable error. The first of these blunders is the attempt to analyze an element—some word which represents an elementary conception, and which being elementary must, by virtue of its very nature, resist analysis. It is like cutting at an atom, or trying to analyze gold or platinum. It is like the idle work of the old alchemists who believed in transmutation. Indeed, it is worse than this. It is conceivable that matter in all its forms may turn out to be one in substance, but it is not conceivable that different elementary concepts should ever lose the differences which divide them. Yet this blunder of attempting to analyze what is incapable of reduction, is a blunder perpetual in philosophy, and has never been more rife than in our own day. Let us take the word and the concept of "Life" as a good example. When we look at the attempts to define it, we can see nothing but failures which very often are not only egregious, but grotesque. Thus, the philosopher whom I have before

quoted, Mr. Geo. H. Lewes, defines Life as "the connexus of the organic activities": and again, as "a complex whole of various particular facts, abstracted from those particulars, and raised into an objective reality": or again, "the organism is the synthesis of the parts, and life is the synthesis of their properties."

These formulæ are pretty nearly perfect specimens of the worst fallacies of Language. In professing to define one word with a well-known and definite meaning which is all its own, they employ half a dozen other words which have no definite meaning at all; whilst the central idea, which it is the business of every true definition to emphasize, is either expelled altogether or hidden under a cloud of ambiguities. An "organic activity" is a living activity: and a living activity is an activity of life: so that we find ourselves landed in the truly luminous definition of Life—that it is the "connexus" of its own "activities." This is a definition which would be quite as applicable to a steam-engine, or to an electric battery, or to any other bit of mechanism whatever. But a still more celebrated philosopher has excelled Mr. Lewis in the obscurity and confusion of his results in attempting to define Life. I refer to Mr. Herbert Spencer. These results are summed up in this wonderful sentence: Life is "the definite combination of heterogeneous changes, both simultaneous and suc-

cessive, in correspondence with external co-existences and sequences." I shall not trouble you now with any analysis of this analysis. You can see at a glance its inutility for any useful purpose.

Infinitely finer, and more satisfactory, is the attempt of one of the great fathers of Greek philosophy to present to our own intellectual faculties some other mode of conceiving that which we all mean by Life. "Every natural body partaking of life may be regarded," says Aristotle, "as an Essential Existence" (*οὐσία*). But if any general formula is required, he finely adds, "it is the primary Reality of an Organism"—using a Greek word (*ἐνέλεχεια*) which is almost untranslatable in English, but may be represented fairly as the "Final Cause of an Organism." * This is at least a definition which—unlike the definitions of Lewis and of Spencer—does not degrade the word which it professes to analyze. It does not cut out of it, or hide, the one central idea in its meaning which makes it what it is. It is, moreover, in strict accordance with the conclusion to which biological science has been compelled to come—that Organization is not the cause of Life, but that Life is the cause of Organization. Still, it may be fairly argued that, inasmuch as the definition of Aristotle does involve this conclusion, it is in itself somewhat more than a mere definition—passing out of this category into the

* Lewes's "Aristotle," p. 231.

region of necessary inference. I am not sure that it can be said with strict accuracy that when we think or speak of Life we think or speak of it in its capacity as the cause of all visible organization. It is true that when we come to think about it we see that some embodiment is the manifestation of Life which is most universal and most patent to observation. But this conclusion is hardly the result of pure analysis, seeing that Life is pre-eminently that of which we are conscious in ourselves, and we are not conscious of any identity between our organs and our Life.

Grand and true, therefore, as the formula of Aristotle may be, and standing as it does in splendid contrast with the confused or empty words in which the same attempt is made by modern philosophers, I do not present it to you as an example of the kind of analysis which I am now urging you to apply to Language. That kind of analysis is much more simple. It ought to aim at avoiding inferences, however certain. These will follow in due order when the foundation for them has been laid in clearly ascertained facts respecting the actual contents of Thought. Our business, I repeat, in analyzing a word or a phrase, is exactly the business of a chemist in analyzing a mineral. We have simply to ascertain all the ingredients—taking care not to insert anything that is not clearly there, and taking equal care not to omit anything that is certainly included.

For this, Gentlemen, is the second blunder which is constantly committed by those who profess to give us an account of our own ideas in the analysis of words. It is not merely that they may overlook, through carelessness, elements of thought which lie comparatively hidden under the unavoidable ambiguities of speech. But it is that they deliberately set themselves to explain away, and to render no adequate account of, elements which they dislike to recognize, because it does not suit their philosophy to include them. In acting thus they are simply acting like bad chemists. What would you think of an analyst in your College Laboratory, who gave you an elaborate report on all the elements of some complicated substance, except some one or two of those elements which, from carelessness, or inattention, have been omitted from the account? I don't think that any of you so acting would pass an examination at the hands of my friend, your distinguished teacher, Professor Crum Brown. Yet this is exactly what many verbal definitions are now framed to do, in the interest of particular schools of thought. And this is another of the many sources of fallacy in thought which we shall be enabled to detect and to expose by the practice of that honest and true analysis of words, which consists in simply noting in them every element of thought which is distinctly separable from others; by keeping always separate

names for separate ideas; and by perfect candor in dealing with our own mind in rendering a full and complete account of every element we can thus discriminate.

III.

And now, Gentlemen, let us advance from theory to practice—from precept to example. Let us take three words or phrases common severally in three very different spheres of human thought—Politics, the Physical Sciences, and Religion. I invite you to accompany me for a short time whilst we apply to each of these phrases the process of analysis which we have been considering, and to look with me at the light which can thus be thrown upon the separate subjects they refer to.

You know that there is at least one department of politics which claims to be a science, and which therefore we can deal with academically. In Scotland we are all proud, and justly proud, of the great name of Adam Smith, and of his "Inquiry into the Wealth of Nations." I suspect that few men except students read it now. It has fallen somewhat out of date. Yet, none the less on that account, it is an immortal work. Probably nothing ever written by a philosopher in his closet has had so powerful an effect on the conduct and affairs of men. Now, it is a curious fact that Adam Smith never attempted to give any

deliberate and formal analysis or definition of the word, and of the concept, which formed the subject of his great inquiry. "Wealth" he assumed to have a meaning sufficiently well known to be handled without any such definition. And so it had—for the kind of handling which he gave it—as it still has for the special purpose he had in view. That purpose was mainly practical. It aimed at exposing the actual operation of legislative and financial systems, affecting commerce, which defeated their own object, and retarded instead of promoting the prosperity of nations. In order to prove this it was not necessary to discriminate all the elements of thought involved in the word Wealth, or to define its meaning otherwise than by such expressions as might be its rough equivalents in the ordinary use of speech. Accordingly we find Adam Smith repeating those ordinary expressions over and over again in various forms,—as when he designates Wealth the "Produce of Labor," or the "Productions of all the various Arts," or as when he says that the multiplication of these arts occasions "Opulence." But his most frequent phrases are such colloquialisms as "the necessaries, conveniences, and amusements of life." These were quite enough for his purpose then. But they are not enough for our purposes now. Later writers have been more ambitious in their aims—more theoretical in their reasonings, more abstract in their concep-

tions. In their hands the science of political economy has fallen into comparative disrepute, and instead of guiding men more and more in practical affairs, has come to be regarded as hardly worth considering. This has arisen not because the conceptions of these later writers have been abstractions, but because they have been bad abstractions. And these abstractions have been bad just because they have been founded on bad or imperfect analysis of concepts, and of their corresponding words. Wealth is one of these. The best definition of Wealth which occurs to me is one given in the Bible. This may seem strange when we are speaking, not merely of accurate use, but of scientific definitions. But in reality it is not strange at all. There are no writers so profoundly metaphysical as the writers of the Old and New Testaments, and it is natural that it should be so if they did indeed handle or express in any special sense the "Word of God"—for I must again remind you that our English term "Word" is not at all equivalent in power to the Greek word "Logos,"—which expresses Reason, or rational Mind, in its highest manifestations. In expressing, therefore, or in reflecting, or simply in recording, any of the intimations which have come to man from the Divine Reason, or Logos, it is but natural that the language of the sacred writers should be "living and powerful and sharper than any two-edged sword." Accord-

ingly, in the parable which enforces the great warning, "Beware of Covetousness," we find a profound reason given for the warning—a reason into which a definition of that which tempts men to covetousness —Wealth—naturally enters. "Beware of covetousness—for, a man's life consisteth not in the abundance of the things which he possesseth." You will observe here how the whole strength of the definition is accumulated in the final word—"possesseth." The whole sentence culminates, as it were, in this word as its end and consummation. The fact—the idea—the sense of possession, is one of the most essential of all the elements in the complex concept expressed by Wealth. Yet this is precisely the element which men are apt to forget in their definitions. They are engrossed in attempts to define the kind of things—of substances, or of objects—in the possession of which Wealth consists. I do not mean that they deny, or intentionally exclude, the idea of possession as essential to Wealth. But they treat the idea of possession as a mere condition of course—lying outside the definition itself of the things to be possessed—and not worthy of any special or separate enumeration. This, however, is a great error, because it is precisely in those items of meaning which are thus set aside as too obvious to be mentioned or particularized, that very often the most powerful elements of the whole word lie hid, and are thus practically forgotten.

Definitions are of no value in themselves. They are valuable only as steps in the further processes of reasoning and research. The great object in this department of political inquiry is to trace the sources of Wealth in order that we may be able to act upon them. But we cannot trace up the sources of a thing when we have no clear conception of what that thing in itself is—what it is made up of—what are the elements of its composition. Now there cannot be the smallest doubt that the idea of possession is fundamental in the concept of Wealth. It is not a mere adjunct, or accessory condition—which may be eliminated from the definition. Whatever may be the things in the possession of which Wealth consists, it certainly does not consist in those things so long as they are inaccessible to our possession. This hall in which we are now assembled might be paved with gold, or filled with the most valuable objects which can be conceived, yet if we could not possess or appropriate any part of them, they would be no wealth to us. No doubt this idea of possession is implicit, or understood, in almost all definitions, however vague or unsatisfactory. Adam Smith's colloquialisms of "the necessaries, conveniences, and amusements of life," imply that the things which partake of this description are objects of possession. This is implied, but it is not expressed. What is out of sight is out of mind. Sometimes the word "enjoy-

ment " represents vaguely the more definite idea of possession. But it is the great object of a definition to drag out into the light of day all such hidden elements of meaning, as well as others which are more obtrusive. And never was it more needful to do so than in this case—for now let us look at the full definition of Wealth as constructed out of the simple but most powerful words used in that divine warning against covetousness. Wealth is—

1st, The possession,

2d, in comparative abundance,

3d, of things

4th, which are objects of human desire.

So far as I can see, Gentlemen, this is a full list of all the separable elements of thought which go to make up the concept which we express when we speak of Wealth. Very simple—very general—perhaps you may say. Yes; but just let us look at the light which this disentanglement of them casts upon the great question of the source from which Wealth comes.

The very first conclusion which we see to be inevitably involved, is that the sources of wealth must be, in the first place, the sources from which possession comes. And this opens up before us immense fields of observation, of history, and of reasoning. Among the lower animals the sources of their possession are the bodily organs with which they have been sup-

plied. Possession means holding—firm holding—secure appropriation. This is obtained by the eagle through the use of his talons; by the tiger by the use of his claws; and by all other animals through the use of some corresponding means of capture. As regards Man, we are thrown back on History, and History tells us that the possessions of every race and people of whom it tells us anything, have been secured by the sword. Even the promise of the Promised Land, though given to the Prophet Moses, had to be fulfilled by the soldier Joshua. It has been the same everywhere. And although we may dislike so rude an origin for all we are, and for all we have, it must be remembered that behind the sword there has been always something that took the place of the great promise to the seed of Abraham. There always have been those gifts of character and capacity which gave to the conqueror all his strength in battle, and all the promise that lay in his dominion for the future. Then, the next stage in the history of Possession is the tranquil, but still the defensive enjoyment of that which had been acquired. Then comes Custom, with its silent growths—building up out of social habits the sense and the forms of acknowledged rights. Next follows that great step—to rights not merely acknowledged in half-conscious Custom, but recorded in written documents, and rising to the dignity of Law. The powerful influence of judicial interpre-

tation follows of necessity the recognition of constituted authority, and of the duty of obedience. In time, we see the whole structure resting on the empire of opinion, on the general acquiescence of society in a great body of accepted doctrines, which are the ultimate basis of all civilized possession.

This is indeed a rapid and a hasty outline of the vast variety of subjects which are involved in any attempt to seek or to explain the sources of possession. It is enough, however, to indicate how multiform these sources are, and, consequently, how far back in the past, and how deep-seated in the structure of the present, lie the fountains on which all wealth depends. Such a panoramic view of an immense country lying before us comparatively unexplored, is well fitted to impress us with the narrow range within which the so-called science of political economy has hitherto been confined. It is not less well fitted to impress on us the dignity to which that science may attain when it comes to be better handled. You may recollect the term which has been applied to it by our great countryman, Thomas Carlyle, when he calls it the "Dismal Science." And dismal for the most part it has truly been. But it will cease to be dismal, when it is more clearly understood that the whole wide fields of history—all the paths, however devious, which have been trod by men from barbarism to civilization—all the causes, mental, moral, and ma-

terial, which have affected their condition from the earliest times,—are only part and parcel of the ground which we not only may but must explore, when we attempt to deal scientifically with that one great source of wealth, which consists in secure possession.

Instead of being dry or dismal, no field of investigation can be so rich and various. Take the case of our own comparatively little country—what a long procession of men and of events rise to our view when we think of all those influences which have led us to the point at which we now stand. Looking back along the ages we see our Celtic forefathers migrating from some far-off home of which we know but little, and passing by routes which it is quite as difficult to identify, invading these islands, subduing and enslaving some more rude but more ancient possessors. Next we see the Celtic tribes fighting with each other in ceaseless internecine wars—so that secure possession of anything was impossible except to those who took service under some Chief, powerful enough in return for that service to afford protection. In that chaos hardly one germinal spot appeared out of which could be evolved any growing centre of authority or of peaceful rule. It is in the midst of this chaos that we hear the tramp and see the standard of the advancing Roman legions. These are but the symbols of that wonderful people who were great in arms, great in art, but greatest of all in law. For

the first time the Celtic tribes see and know what an Imperial dominion is. They recognize the power which secures to all its subjects the all-fruitful blessings of secure possession. This was to them a new idea, with the penetrating force which new ideas have when they run on the lines of truth. Thus the victories of Cæsar and Agricola are followed by the nobler victories of Theodosius and Justinian. For "when the Romans left us" the Latin Church had already entered, and her more peaceful legions knew no retreat. They accepted possessions, but in accepting them the Latin clergy performed the great work of teaching a rude people to reduce their promises to writing, and thus to found security of possession upon recorded deeds. Next we see our early kings, from Malcolm Canmore to Robert Bruce, engaged in effecting that amalgamation of races and union of local powers on which alone a strong national government could be founded. Nor are the sources of our wealth to be traced only in the mere fact of fusion. They are to be traced specially in the peculiar elements that were fused. For the Anglo-Saxon and the Norman breeds were as specially recipient of the good seed of law as the Celtic blood was, by itself, barren and unfruitful in this kind of growth. And so we have to look with certainty for the true sources of secure possession to the rapid though silent and peaceful advance over

the whole of Scotland of the two more northern races.

In this respect there never was, and there is not now, any difference between Britain to the South, and Britain to the North, of the Tweed. All those areas of Scotland which were the real seat and centre of its slowly growing wealth and power, were as predominantly Anglo-Saxon and Norman as Kent or Yorkshire or Northumberland. Nothing can be more erroneous historically than the notion that we have not our full share in the English name, or that we should consider it an affront to have it applied to us. I always tell my English friends that we have all that belongs to them, and all that is our own besides. We are English as much as they are, and our language, save over a mere dwindling fraction of our country, is the English tongue. Where am I now speaking? In "Edwin's Burgh." And who was Edwin? He was an Anglo-Saxon, as more than half of all our fathers were—not by conquest, but by migration, by settlement, and by possession. And in the final predominance of that blood in ultimate union with all other elements, have lain, historically speaking, all the sources of our wealth. The poverty of our country was extreme up to a comparatively recent date. It was due mainly to insecure possession. Over one large area of Scotland in the centre, in the west, and in the north, that insecurity was due to the anarchy

of the Celtic Clans. Over another large area of it to the south a like insecurity was due to the Border Clans, whose race was different, but whose predatory habits and whose military organization were closely similar. A large part of what remained of Scotland was exposed to incursions and depredations, and private feuds; whilst the whole people and nation were impoverished by constant wars with England. With the Union of the Crowns something like security began to spread, because the Borders ceased to be Borders, and because the Highlands and even the Islands began to be reduced to order. But it was not till the Union of the Parliaments that anything like wealth arose in Scotland, because it was not until then that possession became really established by a sense of security in the minds of men. Above all, it was not until then that it was extended to opportunities which had never been possessed before. Our commerce before the Union was poor and feeble because its area was narrow and restricted. By the Union it was opened to the Colonies and Plantations, and these new opportunities of traffic became rapidly the richest of all our possessions.

I pass over the second of the four separable elements of thought which our analysis has traced in the meaning of Wealth—namely, the element of comparative abundance. This element of plenty is perhaps more universally seen and recognized than the others.

I need not detain you even for a moment on it. I pass at once to the third of the four—to the conception embodied in the single word "things"—the things which a wealthy man, or nation, is said to have in some comparative abundance. We cannot possess without possessing something. What, then, are the "things," or the kinds of things, in the possessing of which Wealth consists? This question has been the grand hunting-ground of the Economists. It has been said that such things must be material—things eatable, things drinkable, things put-on-able, or things in some other respect useful. Some text-writers have therefore adopted as a generic term the ugly word "utilities." Yet who can help feeling, when he comes to think of it, how meagre such a conception is? Even Adam Smith's vague phrase, "amusements of life," can only be brought under the heading of Utilities by some quibbling and squeezing. Here again is another case where the richness of common speech is in splendid contrast with the poverty of the specialists who think they are giving us scientific definitions. The English word "Thing" is applicable, and is habitually applied with an immense range of meaning. A whole chapter in the history of philosophy might be written on the import of that solitary word. In the oldest translation of the Psalms, that of the English Prayer-book, the word "thing" is applied to the Almighty: "For Thou, O Lord

God, art the thing that I long for." * Berkeley was started on his fruitful speculations by the question whether the latinized counterpart of thing—"reality" —thingality—could be applied to Matter as known to us.† It is not necessary to be a pure Idealist in Berkeley's sense in order to see and to hold—hold the truth that Matter does not constitute all that we understand by "things." Neither does any conceivable grouping of material substances constitute all that we mean by Wealth. We live, no doubt, in a material world, and our conceptions and desires are all more or less concerned with matter. Yet it is not material substances, but the relations between them, and again between these and ourselves, that we habitually speak of as "things." Many abstract conceptions of the mind are the most real of all things to us. Love and justice, mercy and truth, are all abstract conceptions, and we daily speak of them, and mentally handle them, as things. In like manner many things in the possession of which Wealth consists are things in the same sense—that is to say, they constitute wealth only in virtue of some attribute which is given to them by mind. Money is one of these. Economists are fond of telling us that money is not wealth, which is perfectly true in one sense, and wholly untrue in another. Discs of gold or of silver, or of any other metal, con-

* Ps. lxxi. 4.

† "Berkeley," by Prof. A. C. Fraser, p. 11.

sidered merely as substances, have little or no utility. But when mind, expressed in the laws, in the habits, or in the common understanding of mankind, confers upon these discs of metal a certain definite representative function, then money is wealth, having the highest possible "utility" that any substance can possess. It is the same with all the other forms in which credit is expressed, represented, or embodied. But credit is pre-eminently a "thing." It is so "real" that a millionaire may pass through life, may be engaged daily in transactions of enormous magnitude, enjoying the command over every kind of abundance, and yet may never have any need of even seeing money unless it be to pay a cab. Thus the whole wealth of Modern Society is seen resting upon pure ideas, upon credit, upon systems of acknowledged rights, and of accepted obligations. The wealth of many men and of many institutions consists of property in "the funds." Now what are they? They are promises to pay given by the national Government to those who have lent it money. The whole of that vast property — some seven hundred millions of money—rests upon, and consists in a pure idea—a doctrine—an acknowledged obligation. Dispute or deny that obligation, as some Socialists do now actually deny it, and the whole of that property is gone. And so of other forms of wealth, even those which you are most accustomed to associate with visible, tangible, and material things.

A large item in the revenues of this City consists in feu-duties. What are they? They are obligations to pay which come directly and in unbroken continuity from the feudal system, which again was the necessary product of the military ages in which all our ancestral races began their illustrious career. Read the written documents called "Charters" upon which this City-property depends, and you will find them to be the lineal descendants but little altered, even in form, from the charters granted by our early Kings and Chiefs to those who, in return for service of some kind, were promised secure possession of—that is, the exclusive right of use over—some definite area of land. You, citizens of Edinburgh, have hundreds of "vassals"—still so called by law—who owe you dues which were originally services, although now commuted into money dues, with occasional "casualties." In like manner this City is now said to be negotiating for the purchase of part of the Braid Hills for the exclusive use of its citizens. What does this mean? It means that some old promise of this exclusive use, given many centuries ago by kings long dead to retainers who served them well, is a promise which is still a real "thing," negotiable in the market, and which confers rights which you desire to possess. The Braid Hills themselves cannot be moved from hand to hand, like some bits of their own rocks or turf. But rights of exclusive possession over them

can be transferred, and have been transferred from hand to hand, in surviving documents, for more than 500 years, the oldest of these being dated in 1368, in the reign of David the Second, son of the Good King, Robert the Bruce. So, you see that his promise is still a "thing." It is still a source of wealth to those who hold it, and it will be, I hope, a source of enjoyment, and one of their "amusements," to the citizens of Edinburgh. Let us remember, then, when we think of Wealth, and when we reason upon its sources, what a sweep of meaning must be credited to the "things" in which it consists. And, above all, let us remember that this breadth and sweep is due to the immense variety of mental elements which have been, and still are concerned in Wealth—in its very nature, in its origin, in the causes of its historical development, and in the conditions on which it depends from year to year, and from day to day.

And so, looking into those conditions, we at once encounter the fourth and last of the elements which we have seen to be inseparably bound up in the idea of Wealth. Those things, in the possession of which alone all Wealth consists, have one essential and one universal characteristic. Whether they be things material, or things abstract and ideal—whether they be such objects as cattle, and potatoes, and corn, or whether they be thrones, or principalities, or powers —whether they be products of muscle or of brain, of

science or of art, they must all be "objects of human desire." In this one characteristic their whole value lies. If men do not desire to possess them, they never can be the materials of Wealth.

It is no part of my business to-night to press upon you particular conclusions of any kind. But it is my object to show you how the simple analysis of words introduces us to questions, which are put thereby in so clear a light that many important conclusions are reached in virtue simply of the very terms in which these questions must be asked. If, for example, it be true and evident that Wealth never can consist in the possession of things which are not desirable—of things which no man can covet; if it be true and evident that the things in the possession of which Wealth consists must be objects of human desire,—then what becomes of the doctrine that things are valuable in proportion to the labor spent upon the production of them? Will any amount of toil—whether of the brain or of the hands—confer value upon things which, when produced or made, no man can desire to have? And if the fallacy of this doctrine is thus exposed, what becomes of that other vaguer form in which the same fallacy is often concealed, the assertion, namely, that "labor" is the only source of Wealth? It is curious to observe that the highest truth in this matter is summed up and powerfully expressed in one familiar word, the word

"appreciate." This is one of the many words which exhibit in perfection what I have elsewhere called the "profound but unconscious metaphysics of human speech." As familiarly used the word "appreciate" refers to a purely mental act or condition of the mind. It indicates the state of our mind with reference to some external objects of admiration or desire. But it indicates that state of mind by coupling it and identifying it with that which constitutes value and results in price. That which puts the stamp of value upon things is not the labor, great or small, which produces them, but the affection by which they are more or less "appreciated." But if it be true and evident that the real seat and centre of value is in the desires of men, what becomes of the relative importance assigned by many political economists to the "producing" as compared with the "consuming" classes? Is it not apparent that in consumption lies not only the original stimulus, but the universal guide, and the final reward, of all production? Does it not suggest itself to us, as a consequent truth, that the most fruitful of all producers must be the man who can instil a new idea, who can establish a new taste, who can open, in short, some new channel of consumption? Again, if the value of everything we can produce depends on the desires and wants of other men, and if we never can have any control over those desires, what becomes of the attempt to

divide the price of things into two parts, one of which is said to be "earned" and another part of it is said to be "unearned," by those who sell? My cow or your cow, my sheep or your sheep, may be worth one price this year and perhaps double the price the next year, and yet this increase is due entirely to causes of demand over which we have no control,—which we could do nothing to occasion,—and which in a thousand cases it would have been quite as impossible for us even to foresee. And further, does it not open out before us, as another avenue of thought in the same general truth, that manual labor, which is so often represented as the source of wealth, is itself subject to the same law,—that it is a "thing" of which the value is determined entirely by the wants and wishes of other men, and very often by the demand for it which has been raised by the genius, enterprise, and capital of some individual mind? I know of the case of one rural district where the wages of labor had long been on the lowest scale. The happy thought of one man, noticing a bed of clay, conceiving the idea of a special use for it, and embarking capital in the undertaking, conferred upon the labor of that poor district an increase of value which was about four-fold.

I cannot now pursue this subject further. But you can see how fruitful of suggestion the simple analysis of Wealth has been. You can see, too, that the sug-

gestions all point in one direction, and that is to show how multiform are the sources of that aggregate of material prosperity which we call Wealth, how deeply seated they are in the whole history of the past, and how subtilely interwoven with all the social and intellectual conditions of the present. They all tend to condemn every word and phrase which represents Wealth as the product of any one class of men invidiously distinguished and artificially separated from others. They all tend to confirm the wholesome conviction that we are all "members one of another," and that this brotherhood extends—specially extends—to all the generations of those who have gone before us, from whom we have inherited our customs, our laws, our common stock of accepted intellectual conceptions and of recognized moral obligations. Lastly, they impress upon us that most animating and encouraging of all conceptions, that in the immense variety and inequality of human character and gifts, each one of us may contribute something valuable, perhaps very valuable, in building up the organic structure of national prosperity, by rescuing from neglect, or defending against attack, even some little bit or fragment of the Truth.

IV.

I pass now to one of the physical sciences, if indeed that name be altogether appropriate to Biology, which is physical, certainly, in one respect, if it be as certainly not physical in another. In that science I take one phrase which, for the last thirty-five years, has been so familiar as to have become a commonplace. I mean the phrase "natural selection." You know something of the controversies which have raged, and which still rage around it. I do not venture to tell you that the simple methods of analysis which we have tested in the case of the word Wealth, will enable you to solve the many mysteries which lie hid under the phrase "natural selection," as purporting to explain the origin of specific forms of life. But I do confidently tell you that you will find this method of analysis to be a most powerful instrument in clearing the path before you. It will enable you to arrange and reduce to an intelligible order the concepts which are involved. And when this order has been established, perhaps you will find that certain conclusions have been established also.

In the first place, then, it is to be noted that the phrase "Natural Selection" is highly metaphorical. I do not mean merely that there are some elements of metaphor involved in it, as they are involved in

almost all words. I do not merely mean that the phrase is metaphorical in the sense, for example, in which the word "understand" is metaphorical—or the word "apprehend"—or the words "hold" and "uphold"—are all metaphorical when they are applied to mental work in arriving at opinions, or in defending them. These are mere ordinary examples of what Tennyson has well called our "matter-moulded forms of speech." The phrase "Natural Selection" is metaphorical in a more special sense than this. It is not a "matter-moulded form of speech." On the contrary, it is distinctively a "spirit-moulded" phrase. "Selection" is the appropriate word for the purely mental act of choosing—an act which is the peculiar function of a free and deliberate Will. This is the fundamental idea on which the whole meaning of the phrase is hinged. The act of choosing is the concept, and the mental image, which is characteristically presented to us in the phrase "Natural Selection." This is a matter not of opinion, but of fact. It is the first and obvious result of the simplest process of analysis—as certain and as simple as the first step in the chemical analysis of iron pyrites, which would show that sulphur is the material element which gives to this mineral its characteristic form and color.

The next step in our analysis is equally simple and equally definite in its result. Choice cannot be exer-

cised except upon materials which are already existing, and are presented for our selection. Choice assumes the pre-existence of the things amongst which we choose. Therefore our choice can never be the cause, or the origin of those things. They must be, before they can be chosen. They must be presented to us before we can select among them. Therefore our selection cannot make them. It has to find them ready-made.

And now we come to the selecting agent which is suggested in the word "Natural." Nothing can be so loose as the meaning of the words "nature" and "natural" in ordinary speech. Unfortunately in science it is often used with equal ambiguity. In the phrase "Natural Selection" it is used mainly to indicate that the selecting agency is not the agency of man. Moreover, in excluding the agency of man, the intention generally is to exclude the agency of mind. Nature is understood as the region of purely physical causation. Here we detect a tremendous break between the metaphor and the sense in which it is applied. That kind of separation among things, which is effected by the choice of a living Will, is a very different kind of separation from that which is effected by purely mechanical causes under no direction or control. This is one of the commonest of all the tricks we play with language. We choose a word expressing some idea which constitutes all its effect-

iveness and plausibility. We then apply the same word, in a sense from which that very idea is intentionally expelled, and yet we keep the word in order to keep also the atmosphere of plausibility and of reasonableness which that expelled idea has alone conferred upon it. Thus the word "selection" expresses primarily that special kind of separation among things which is effected by a Will having the gifts and the opportunities of choice. We then go on to apply the same word "selection" to that totally different kind of separation among things, which results from forces purely physical acting under no guidance or control. But these two conceptions are so widely diverse that it becomes a mere fraud upon ourselves and others to use the same word to express them both. When a living Will selects one thing out of several, or a few things out of many, it always does so for some further purpose. Among stones and rocks we select those which can be turned into special use. We choose limestones, and separate them from other rocks, because they can be converted into a cement by burning. We choose sandstones because they can be easier turned into materials for building. We choose certain kinds of wood, and separate them from others, because they are more workable, or more durable, or more beautiful. In all cases some purpose lying in the future—some use which can be foreseen, and can be secured,—is the whole cause and principle

of separation when selection is exercised by a voluntary agent. How can selection in this sense be attributed to some purely physical cause? Quite easily; by playing on the ambiguities of language. **"Use," as a mental motive in selecting,** may be identified and confounded with "use" as a mechanical fact in the actual play, exercise, or movement of an existing structure. "Use" as a mental motive can and does explain the origin of many structures, because it precedes the structure, stands outside of it, chooses the materials of it, and puts these materials together. But "use" as a mechanical fact can never explain the origin of a structure, because the structure must exist before it can ever have been put into motion or into use. Thus, "natural selection" as a phrase for explaining the origin of any new organic structure, is a phrase which trades, as it were, on most fallacious ambiguities. It seeks the cover, and it gets the credit of "use" as a well-known cause of the origin of many things, namely, mental purpose. But under this cover the phrase is one which substitutes another kind of cause which is an impossible cause for the origin of anything, namely, the actual exertion of structures which have not yet been constructed. The case may be put shortly, thus:—that organic structures have been made for use, is an intelligible and rational proposition. That organs have been made by use, is an unintelligible and irrational proposition, being a contradiction in terms.

The result of this analysis is at once quite clear, and of great importance. It proves that the phrase "natural selection," as purporting to explain the origin of organic structures, is a very mixed and confusing metaphor. In the first place, it ascribes to a purely physical cause the attributes and prerogatives of mind. In the second place, it assumes the operation of that physical cause under conditions which are self-contradictory and impossible.

Let me now point out to you a curious and instructive fact which confirms the result of this analysis of the phrase Natural Selection. When we allow ourselves to be deceived by confusing phrases of this kind, and when we get imbued with some favorite theory founded upon them, then such theories become, as it were, separate inmates of the mind, with fears, likings, and antipathies of their own. Under their influence we dislike and turn away from all facts and truths to which these inmates are antagonistic. The logical nature of this antagonism may not be clear to ourselves. But our theory, or preconception, like a separate creature, scents and feels that antagonism from afar. And so in this case, the preconception of "use"—actual use—being the physical cause of organic structures, feels instinctively the incompatibility and antagonism of all facts which exhibit such structures growing up through stages in which actual use is impossible, but of which preparation for

uses lying in the future, is the natural explanation. This is the secret of a memorable passage in Darwin's "Origin of Species" respecting the electric organs of certain fishes. These organs stagger—and almost confound—him. "It is impossible to conceive," he exclaims, "by what steps these wondrous organs have been produced!"* Now—why this special wonder and astonishment? What is there in a special organ for the discharge of electricity more wonderful than in a special organ for catching in a fine net the minute crustaceans of the ocean in such myriads as to afford sustenance for the largest animal in the world? Or what is there more wonderful than in the special organs which enable heavy bodies to fly on the thin air? I remember, some forty years ago, the late Professor James Forbes telling me in this city that, although he knew that a bird's flight must be due, somehow, to the "resolution of forces," he had no conception how this resolution was effected, and that the phenomena of flight were to him almost miraculous. Why, then, does Darwin pitch upon electric organs as supremely inconceivable? Can it have been the mere rarity of the structure? Did it thus strike his imagination only because we so seldom see it, because so very few creatures have been provided with it? No—this was not the cause of Darwin's wonder. If you observe his words, you will see

* "Origin of Species." Ed. 1873, p. 150.

that this is not the influence that inspires them. It is not the structure that puzzles him. Neither is it the function of that structure. It is its "origin" that confounds him—or, as he expresses it, "the steps by which it has been produced." This is the inconceivability to him. And why? Because an electric battery constructed out of animal tissue, is an organ which must be useless until it is complete. Therefore, "use" in the future, as a motive operating upon Mind, is in this case the only possible substitute for the idea of use in the present operating as a physical cause. But from this substitute and alternative, the preconception in his mind would insist on turning away its face. In the case of incipient wings, it is conceivable that—not indeed in the very earliest, but—in comparatively early stages, they might be useful in the meantime, although their final function was yet unattained. Birds might flutter before they could fly, and by fluttering up to trees they might escape from prowling beasts. As a matter of fact the earliest fossil bird-wing indicates this kind of use. In like manner, whales might find advantage in very early stages of the wonderful whalebone netting, by which the "right whale" now obtains its food. But no such conception can be entertained as regards an electric battery in process of being gradually built up in the tissues of a fish. Therefore "the steps" in that

building must have been steps directed to a use lying in the future—to a use foreseen and predetermined.

We now know from Darwin's correspondence that his instinctive antagonism to such facts and conceptions as are inevitable in this case, was an antagonism of which he was distinctly conscious, and which he expressed in words. He could not abide the idea of what he called "prophetic germs," declaring that if it could be established, it would reduce his own theory to rubbish. Yet nothing can be more certain than that all germs are "prophetic." The very word implies it. The very essence of a germ is that in it some definite future lies. Nor is this idea at all inconsistent with the true idea of development or of evolution. On the contrary, the two ideas are correlatives of each other. In all evolution there must have been involution first. That which is developed or unfolded in external form and function, must have lain infolded in the germinal plan of growth. It is undeniable that this is the law governing the origin of every individual organism. We have all legs before we can walk; we have all lungs before we can breathe; we have all brains before we can think. And if the doctrine be true, of which Evolutionists are fond, that the growth and development of the individual is an epitome and rehearsal of the growth and development of the species to which

the individual belongs, then it is strictly according to the constitution and course of nature, that we should find throughout the organic world, the existence of structures the elements of which have not been separated mechanically by use, but which were in course of being chosen and built up for use, on the principle and by the agency which the word Selection properly represents.

And do you know, Gentlemen, that splendid work is being done now in one of your college class-rooms in elucidation of this great mystery of philosophy and of nature? Not to buttress theories of any kind, but in the pure light of strict physical investigation, your Professor of Natural History, Professor Ewart, has been establishing a series of facts which, if I do not much mistake, will go far to clear up the real nature of that "choosing" and "selecting" which we find in nature. Special organs in a growing and imperfect state, as parts of a creature the whole of which is yet in the same embryo condition, are the most familiar of all phenomena. But special organs in an embryo condition and yet forming parts of a creature which, as a whole, is perfect and adult—this is a combination which has not yet been fully recognized as a fact in Nature. Germs, prophetic of future use, in the lifetime of the individual, are the universal law. But germs prophetic of changes which may lie beyond the lifetime of the creature in which

they occur—germs prophetic of changes which, when they emerge, will constitute a new species—these are, indeed, germs which demand a new interpretation. Yet such is the character of the facts which Professor Ewart's investigations are revealing. He is tracking those "very steps" which Darwin thought it impossible even to conceive—the steps, namely, of commencing and advancing structure, by which electric organs are being built up and prepared for use. It has long been known that although the Mediterranean Torpedo is the only species of Ray in European Seas which can discharge powerful electric shocks, yet the same kind of organ—often in a form imperfect and devoid of functional activity—exists in some other members of the same family of fishes. An electric organ, for example, exists in our own common Skate, and we now know that it exists also in several other species of Ray which are almost equally abundant in our own seas. Yet in none of these are the electric organs useful functionally. So far as known they are entirely useless at the present time. No fisherman handling them, even in the case of very large and powerful individuals, has ever felt the slightest shock. Nor in Vivaria are they ever observed to stun their prey, as the Torpedo does, by any electrical discharge. Professor Ewart has undertaken to investigate the steps of structural development by which these organs are passing through stages of inutility—from pro-

phetic or potential, to functional and actual, activity or use. The results have been communicated to the Royal Society of London in two remarkable papers, to which I must refer you.* The electric organs of the Torpedo have had a whole literature devoted to them, and some of the most eminent men in the history of electric science, as well as in physiology, have made them the subject of a yet unexhausted investigation. But there is one remarkable difference between these organs as they exist in the Torpedo, and as analogous organs exist in our northern Rays. In the Torpedo they are strictly congenital. They must, of course, have begun at some time or another in the past. But as regards the existing Torpedo, they are born with the embryo. Before it leaves the "purse" or egg, in which its embryotic stages are passed, the electric organs are developed along with all its other parts, and the infant fish begins at once to discharge its shocks. The electric battery grows with its growth, and strengthens with its strength. All this is different with the northern Rays. In their case we seem to be present at the commencement of these organs. Some of these Rays are born or hatched with no trace of a battery. It is not begun until the fish has almost reached maturity. Thus, by taking specimens of all ages, Professor Ewart has been able to trace all

* "Phil. Trans. Roy. Soc. London," vol. clxxix., 1888: "The Electric Organ of the Skate."

the "steps" of this marvellous development. The reasonable principle—the logos—is the same in all. There are certain things that must be done—certain preparations that must be made, before an electric battery can be ready for use. There must be heterogeneous materials placed in such close contact, and surrounded by such a medium, as to set up chemical action, out of which the electric action comes. There must be provision made for the evoking or development, the storage, the isolation, the conduction, and, finally, the discharge of that mysterious agency, what we call the electric force. In the batteries made by man these various provisions are made by the arrangement of various materials, such as heterogeneous metals, acids, conducting and non-conducting media. But nature has to do it out of one fundamental substance—what has been called the protoplasmic "basis of Life," and accordingly it is done by changes of infinite complexity, and of fathomless mystery, in the ordinary muscular fibre of the fish,—in the ordinary nervous tissues,—in connective and insulating tissues —all elaborately "selected" for the final purpose. Professor Ewart has been good enough to let me see his microscopic sections, which show all these preparations in their course of progress. No words of mine can convey to you the impression they made upon me. There is but one word—a word which all men actually use—which can express the general re-

sult. That result is an "apparatus," one of the many words which illustrate the true force and use of language, when the mind instinctively confesses to what it sees, and when a false philosophy does not tempt it to shut its eyes, or to close its lips, or to distort its words. A "preparation for" is an apparatus; a thing made for a certain use—not made by that use as an agent—but for it, as a purpose. Yet it is rare, indeed, to be able to see an organic apparatus in the course of being prepared,—to see it being made,—to see all its elements on the march to take up their appointed places in the general plan. Unconscious things doing a conscious work!—taking new shapes and forms—nuclei "migrating" from one place to another, and in their new position ranging themselves in proper rank and order. It seemed to me as if I were looking at a miracle: for a miracle does not consist in any breach of the eternal laws of nature. It consists in the absolute subservience of these to special purposes and designs. Never, as it seemed to me, was such subservience more visibly exhibited. I felt almost as if I could hear the voice which sounded near the Burning Bush—"Put off thy shoes from off thy feet, for the place where thou standest is holy ground."

V.

I now pass, by a most easy and natural transition, to the third and last of the examples I have chosen by which to illustrate the value of the analysis of words. Let us take the word Supernatural in the sphere of religious thought. This is now the great difficulty with many. They say they can believe in almost anything except the Supernatural. Well, but what do they mean by this word? What is its true signification? It means something which is not in "nature," but above it, or outside of it. There is, then, clearly one preliminary objection to this word, that it implies and assumes such a complete survey and knowledge of the whole of "nature" that we can tell with certainty that a whole class of things, very vaguely defined, are not to be found anywhere in all her wide domains. But no such assumption can be made with any approach to truth. We are conscious every day, and more and more conscious the more we know, that there are "more things in heaven and on earth than are dreamed of in our philosophy." This is one part of the case, but only the smallest part of it, against the use made of the concept and the word Supernatural. This part of the case is negative: but there is another part which is affirmative. No wonder men find it difficult to believe in

things outside of "nature." For my own part, I must confess that I find it not only difficult, but even impossible to believe in anything outside of "nature," which is not also inside of it. But then we must ask ourselves: What do we mean by "nature"? We mean the whole system of things in which we live, and of which we are a part. Nothing less large and wide than this can hold all that we mean, and must mean, by nature. Just let any of you ask of himself this question: Am I in nature or outside of it? And if to this question we must all reply that we are in nature, and that the most natural of all things to us is human nature and human action,—then the further question arises—Is not mind, as known to us, inside, and a part of, nature? And this question, again, suggests another. Are we not in common, careless speech, identifying nature with that part of it which we know as matter, and the purely physical forces? Is not the profound difference which seems to us to separate between these and our own partial command over them through our wills, our thoughts and conceptions, the real explanation of the difference which we attach to the words Natural and Supernatural? If so, are we justified in this use of words? As our own minds are confessedly inside of, and a part of, nature, is it really taught us by any knowledge we have, that no other mind than our own has any part therein? Is it not, on the contrary, all the other

way? Does not the whole of the knowledge we possess rest upon the foundation that "nature" replies to our mental interrogations of her by answers which correspond? As Lange, the historian of Materialism, says, the basis of all science is the Intelligibility of Nature. And what does this mean, except that the scientific explanation of every phenomenon in nature consists, and consists only, in the bringing of that phenomenon into relation with some faculty of our minds. As I have elsewhere expressed it, "this is an axiom which asserts that the system of nature is in close correspondence with the intelligence of Man. But this correspondence must be with the whole of man's intelligence, and not with a bit of it only. Those who would restrict it to a part of our Intelligence, and that part certainly not the highest, are not reasoning in consistency with the axiom, but in defiance of it. The doctrine of the Intelligibility of Nature demands that this intelligibility should be, at the very least, co-extensive with the whole range of man's intelligence, and must embrace especially the higher faculties as well as the lower."* What, then, are those faculties which we all instinctively recognize to be the highest? They are our Will—our power of conceiving purpose—our faculty of design. And is it not notoriously—obviously impossible to describe the facts and arrangements of Nature with-

* "Unity of Nature," pp. 199, 200.

out describing them in the words and phrases—"plan," "contrivance," and the rest of them,—by which we describe our own analogous works and ways? No scientific man has ever used this vocabulary more profusely than Darwin—as, for example, in his beautiful book on the "Fertilization of Orchids." And it is most curious to observe how,—in his more celebrated work, "The Origin of Species"—sometimes, quite unconsciously, in explaining facts, he passes from the forms of speech which express physical causes to those which express the intellectual agencies through which causes are subordinated to reasons. Thus, for example, in replying to objections he had encountered from the unity of mechanism which prevails in the optic apparatus of animals, whose whole structure is so different that they must be separated absolutely and widely in the classification of organic life, Darwin gets over the difficulty—not by genetic causes of any kind, but by resorting to an explanation of the reason why the apparatus must be made in a certain way, if it is to attain a certain end. In this case the phraseology of purpose is elaborate and sustained. "An organ for vision," he says, "must be formed of transparent tissue, and must include some sort of lens for throwing an image at the back of the darkened chamber." This is the Reason—but in no other sense is it the cause of the unity of structure of eyes throughout organic nature.

Darwin, in this remarkable passage, gives us the very highest form of a truly scientific explanation. That is to say, he so marshals and arranges the facts of nature as to place them before us in their highest relations with each other and with us. It is an explanation which does not dispense with the idea of physical causes, but which places before them, and above them, the idea of a logical necessity. And in that necessity, as part and parcel of it, we see the conception of invariable physical laws in perfect harmony with the conception that mind can and does exercise a lordship over them. The word "must" in this explanation rests upon the constancy of the properties of light. It can only be transmitted through certain media; it can only be reflected from certain surfaces; and it can only be refracted by textures of certain molecular construction. Therefore—for this reason—in order that light should be made available for the formation of visible images, all these things "must" be prepared. This is, so to speak, the objective side of the necessities which must be met. Then follows the subjective side—the side which represents the machinery of perception, or sensation. There is a "must" here, too—a "must" which, to us, lies hid in that mysterious region where mind and matter, as we know them, meet in our own bodies, and in the bodies of all living things. The whole of this explanation is physical in one sense, and super-

physical in another. It is "natural" in one sense, and super-natural in another. It is human—perfectly, almost intensely human—in the intellectual faculties to which it appeals, and in the methods of operation which it refers to as familiar. But it is super-human—immeasurably super-human—in the knowledge of, and in the resources over, those material agencies which are subordinated to the end in view.

I have already spoken of the tendency of particular preconceptions—like the preconception against what is called the Supernatural—to set themselves up as separate existences in the mind, and to impart to the whole of its powers their own instinctive aversion to all antagonistic facts, and to all conceptions which they feel to be incongruous. It is in this way that the preconception against the Supernatural dreads and dislikes such logical, or reasonable, explanations as Darwin gives in regard to the unity of the optic apparatus in creatures in which that unity is not genetic. Such explanations are based entirely on the intimate correspondence between our own intellectual perceptions—our own rational methods—and the governing agencies in Nature. But the conception of this correspondence is precisely that in which the Supernatural essentially consists. Accordingly, a whole vocabulary of words has been invented for the purpose of describing such phenomena in terms which may serve to exclude the obnoxious

concept. Thus, for example, the phrase "Reflex Action" has been invented in physiology to designate that kind of action in organisms by which they respond to some external stimulus by some movement which has an object or a use. If the stimulus be a tickle, or a puncture, the responsive action is directed to the removal of the offending substance. That movement may or may not be conscious. It may be as perfect in sleep as in the waking condition. Or in some of the lower animals, such as the frog, it may be as perfect when the creature has been decapitated as when that centre of sensation was in its right place. It is obvious that such movements are the results of some mechanically adjusted apparatus —of some mechanism adjusted to produce a rational and useful result. This obvious characteristic can be kept out of sight by such a phrase as "reflex action." It has a purely mechanical sound about it. Light or sound striking on certain surfaces are bent back, or reflected from it. This is strictly reflex action. An echo is an example. I have a very fine one close to my own door in the country. It is against the wall of a Bridge. If I ask it the question, "Who are you?" it responds instantly by a repetition of the same question. But if in reply the Bridge were to send back a rational reply, saying, "I'm a bridge," what would you say of the man who described this reply as a case simply of "reflex action." No doubt

there is the charm of extreme simplicity about this phrase. But it is a simplicity gained at the cost of Truth. In the interpretation of nature—that is to say, in the evidence we tender to ourselves and others as to what Nature tells us of her works, we are bound—even more than witnesses before the highest human tribunals—to "tell the truth, the whole truth, and nothing but the truth." Now this phrase of "reflex action" does not tell the whole truth, but keeps back part of it; and that part, too, the most characteristic and significant of the whole. The action which follows upon a stimulus applied to an organic apparatus is no doubt a "return action." But the action which is returned is not identical, it is not even the same in kind, with the action which is sent. It is wholly different in its nature, and infinitely more complex—a difference so profound that between these two kinds or modes of action there lies the whole immeasurable distance between a purely physical force and a purely intellectual conception. It is like the difference between an electric current and the most complicated message which it can be directed to convey. To conceal this as a visible and unquestionable fact in nature, is to employ language, not to express, but, to conceal her facts.

It would be easy to give you many other examples of the same kind of fallacy in the use of speech—all inspired by that one instinct which comes from pre-

conceptions jealous of the truth. Two more will be sufficient for my present purpose. One is closely related to the last—and has the same connection with the desire to avoid bearing that witness to the predominance of mind in nature which rebukes the very word "Supernatural," as at the best unmeaning. The example I refer to is the word "differentiation" as commonly used in physiology to express the rise and growth of organic structures. If we open an egg in consecutive stages of incubation, we shall see the albumen and fatty oils, of which it consists, gradually being converted into, or being built up for, the construction of all the special organs of a fowl. This process, or other processes of the kind, are often described as "differentiations." But this is again a phrase which seems specially invented to conceal all the facts which are most striking and characteristic. The mere fact that the materials become separated from that kind of combination with which they start, is not the fact which is prominent to our intelligence in looking at the hatching process. That description of the process would be equally applicable to the reverse process by which a rotten egg is "differentiated" into its chemical components. Or it would be equally applicable to that other process by which an egg is "differentiated" when cooked into an omelette. The governing fact in the hatching of an egg is that its materials pass from one kind of combi-

nation to another—that they have a pre-determined and pre-arranged course—that they combine to form one perfect organism for the discharge of functions which lie in the future, and for which they are fitted as a machine or an apparatus.

Another of the phrases now often employed for the same purpose is "correlation of growth." There is here again a sound of mechanical necessity about the words, which serves to shut out the special kind of "correlation" which is conspicuous in nature. There are many kinds of correlation between things. Action and reaction are correlated things, correlated by laws of purely physical necessity. Different colors and different sounds are "correlated" with each other because they are (respectively) vibrations in the same medium, and differ from each other only in relations which are purely dynamic, and which can be numerically counted. But when from such cases of correlation we pass to those which are so described in organic nature, we pass into another region, which is wholly different. That most ingenious part of a steam-engine which is called "the governor" is correlated mechanically with the laws of centrifugal force or motion, upon which its action depends. But it is also correlated, far more fundamentally, with the inventive faculties of the human intellect, by which, through mechanism, it has been compelled to do a certain work. It is likewise and further correlated

with the ulterior purposes which that mechanism is intended to serve. These are "correlations" so different in kind that the word is no longer adequate to express, or even to indicate, the facts. And still less is it adequate to express or to indicate the facts in organic structures. In them the correlations between special structures and the far-off functions which these are ultimately to discharge, are correlations in which the mechanical elements are almost out of sight,—are absolutely subordinate,—and are as nothing to the purely intellectual or purposive elements which represent the superhuman Mind with which all nature is alive. Thus the powerful hind claw of the typical Falcons is correlated with a peculiar arrangement and texture of the primary quill-feathers, by which speed, and impetus, and easy steerage, are all given to flight, and consequently to the blow inflicted by the claw, which is thus made so efficient that, in a single stroke, death is inflicted on the prey. Yet nothing can be more widely separated in composition and in structure than this claw, with its supporting structures, and the feathers by which it is directed and impelled. Throughout the wide range of animal mechanics examples of the same kind of correlation are simply innumerable. But the moment we examine them we see that among the relations which are thus co-ordinated, those which regard the future, intellectually perceived, are clear, definite, salient, and perfectly in-

telligible, whilst those which regard the past or the present in pure physical causation, are purely instrumental, subordinate, and often so exceedingly obscure, as to be almost inscrutable to us.

And here it is well to observe how strong is the witness borne by human speech against the purely artificial and deceptive distinction which has been set up between what we all see and feel in nature, and what men choose to call the Supernatural. If Language is the source of many fallacies, it is not less the home and fortress of the deepest truths. It is the great mine and record of the intellectual impressions of our race; and it is most curious to notice how constantly it foils the attempts of men to efface these records, or to empty them of their faithful and fruitful interpretations. Such attempts are often made. Men do not, indeed, invent words which are absolutely new. Practically this seems to be impossible. But they are perpetually going as near it as they can by re-combining old words, or the elements of words, into special forms, with the special purpose of expunging from the records of speech certain significations which they are desirous of avoiding. This by-word "correlation" is a case in point. "Relation" is a very abstract word, expressing a very abstract conception of the mind. But that abstract conception is one within which all knowledge is contained. We know things only as distinguished from—that is,

as related to—each other. When we take the Latin word "con," expressive of a particular kind of relation, and prefix it to the more general word "relation" in the form of "co-relation," we express the idea that some particular bundle of things, whatever may be their mutual relation to each other, are grouped together by some other relationship which is common to them all, and which relationship has reference to something else which is outside of or beyond the group. "Correlated growths" in an organism are thus implicitly explained to be co-related as one group to some other thing or things—which are left in the vague—undetermined, and unexpressed. It is into this unexpressed region that we must follow the group, and the writer or the speaker who groups them, to see what are the facts or things thus kept artificially out of sight. And when we do this—when we get into the fresher air of those who describe nature simply and naturally in the words which are suggested to them by the very structure of their own intelligence, and by the corresponding structure of that natural system in which we live and in which we think—then we find universally that all special groups of things are best explained in the language which assumes a superhuman Personality to be the supreme agency in nature. I have already observed upon the richness of Darwin's language in this instinctive resource of thought. There are many men

who think that the language, or forms of speech, which ascribe intellectual relations to natural phenomena, is not strictly scientific—that however true this ascription may be, it belongs to another region of thought—namely, that of Religion or Theology. I do not assent to this view, because the very definition of Science is the knowledge of things in their distinguishable relations; and because the relation of organic structures to their future functions and destinations, is quite as definite, and as certain as the relation (for example) of other things and structures to the laws of quantity and of number. I do not say that this strictly and purely scientific perception of Purpose and Design in nature extends beyond these conceptions in the abstract. I do not say that they include knowledge of the seat, or of the character, or of the other attributes of the superhuman Mind which is the fountain-head of the purposes so conspicuous in nature. These further regions of inquiry, I fully admit, belong to Religion and Theology. But I am now speaking exclusively of the phenomena in nature which our own mind recognizes as mental, and which it invariably expresses and describes—sometimes in spite of itself—in words and phrases which have no other meaning.

I have the best reason to know that Darwin himself was very far from being insensible to the evidence of this truth. In the year preceding his death he did me the honor to call upon me in London, and

in the course of our conversation, I said to him that to me it seemed wholly impossible to separate many of the wonderful adjustments which he had so laboriously traced and described to any other agency than that of mind. His reply was one which has left an ineffaceable impression upon me—not from its words only, but from the tone and manner in which it was given. I have told it before, and I will tell it to you again. "Well," he said, "that conclusion has often come upon me with overpowering force. But then—at other times it all seems"—and then he passed his hands across his eyes—as if to indicate the passing of a vision out of sight. Nothing can be more natural or intelligible than this. Nothing can be more difficult for us than to take in, or fully to realize, that omnipresence of the Supreme Mind which so many natural phenomena involve, and with which others seem so hard to reconcile. But after all—is not this confession of Darwin in very near harmony with the words of Job: "Lo, He goeth by me, and I see Him not: He passeth on also, but I perceive Him not." *

Nor is it Darwin only whose scientific descriptions are redolent of the words and phrases which ascribe to Nature the attributes of Mind. Even those men whose theories and philosophy make them most zealous and most watchful against that they call teleological language, are compelled, in describing and ex-

* Job ix. 11.

to the last Edition, and in reference to some objections brought against its teaching, you will find the following sentence:—"Absolute ignorance as to the proper use of the word 'Force'—even among the exceptionally well educated—must be all but universal." The passage then goes on to say—"In all probability there is no such *thing* as Force—which is suggested to us by the impressions of our muscular sense—any more than there is such a *thing* as Sound or Light, which are mere names for physical impressions produced upon special nerves by the energy of undulatory motions of certain media." Here we have the true reconciliation between the pure Idealism of Berkeley and that full acknowledgment of external matter of which the worthy Bishop of Cloyne was so jealous and so much afraid. The conception of matter, and of its energies, is not abandoned or explained away. On the contrary, it is made more precise and definite. And yet the reality of the subjective or ideal element in sensation is equally maintained. Thus the truthfulness of our knowledge is placed on the firmest basis in that very explanation of its nature which demonstrates its complex relativity to external things. That relativity is one of adjustment between a prepared organ and certain material energies to which it is specially adapted. Darwin's explanation of the essential unity between the eyes of all seeing creatures, however remote from

each other in genetic relationship, is the only possible explanation, not only of that and of every other special organ, but of the whole of every organism to the world around us. But that explanation is one which addresses itself to the reason—to our "Logos" —as appreciative of the Logos which lives and works in Nature. In order that certain effects should be produced, certain things must be done—certain preparations must be made—certain machines must be constructed. This is the argument. And it is one which embraces everything that men call the natural, as well as everything that they sometimes shy from as the supernatural. The "must"—the physical necessity—represents the domain of material causation. The "in order that"—the purpose—the aim —the end—represents the domain of Will, and of some Personality which is certainly superhuman. And the particular case in which Darwin has applied this explanation is the case in which it is most far-reaching and sublime. Nothing in modern science is so striking and so instructive as its analysis and explanation of that group of relations between different things to which, collectively, we give the name of Light. It is true that the analysis and explanation of the analogous group, which we call Sound, involves the same principle. But the medium which conveys sound belongs to our earth, and may possibly belong to it alone. It is conceivable that no other

planet may possess that very special and nicely adjusted mixture of gases, which constitutes our atmosphere. But in the case of Light, we grasp the idea of a medium through which we are, as it were, in rigid contact with the most distant stars in space. And when we come to understand that our optic apparatus is so constructed as to give us wholly separate sensations for different vibrations in this medium, which are so minute as to be almost inconceivable in any other form of measurement; when we further come to understand that upon this language of sensation we depend for everything which is involved in light, we get hold of an idea in respect to the unity of the whole system of Nature, which is one of the grandest and most reassuring of all conceptions. It is no small satisfaction to see the nature of that homology which all languages recognize between light and knowledge. It lies in the suggestion which such "correlated" or adjusted physical and psychical facts must impress upon us,—that just as we now know an eye to be apparatus which enables to appreciate the facts and phenomena of light, so our intellect as a whole is likewise an apparatus which enables to apprehend those higher facts and relations between things and phenomena which constitute intellectual and moral Truth.

I need hardly point out to you how perfectly this conception harmonizes with that definition of Truth

which I quoted to you at the beginning of this address, as arrived at by a modern philosopher in the exercise of pure abstract reasoning: "Harmony between the external and the internal order" is exactly the description which applies to the harmony which has been prepared between the light of heaven and the inconceivably intricate structure of the lens, the camera, the "rods," the retina, and the nervous network of the eye. And the mental—or intellectual—character of that harmonious correspondence is not less conspicuous than its existence. It indicates that the unity which we see in Nature is a mental unity. It indicates that what we call the system of Nature is intelligible to us because it is itself a reasonable system—a spiritual kingdom. It indicates, too, that we are not merely subjects of this kingdom—but parts of it—having our own place in it, with a special range of co-ordinated powers. It is a system in which we live and move and have our being—one in which we can only thrive by conformity and obedience, but in which, nevertheless, we have sufficient freedom to set up—for some little while—the standards of anarchy, which are the standards of rebellion.

One great animating and comforting result of this inquiry is that we may love Truth with hope. For the same process of reasoning which shows us that it is susceptible of definition is equally powerful to

show us that it is capable of attainment. It is in virtue of our very structure of body and of mind that we are fitted to apprehend it. It is true, indeed, that this power of apprehending the truths of Nature is a power which has its limits. But it is also true that we are conscious of the limitation, and that we are therefore always consciously in the presence of a Beyond. Limitation does not involve untruthfulness. Between two lines, one of which is very short, and the other of infinite length, there may be perfect coincidence of direction. It is the running of our mind in a true direction that constitutes Truth to us. There is a subtle temptation sometimes besetting us to get rid of responsibility for opinion by pleading the limitations of our knowledge. But this is a fallacy. Our faculties are none the less truthful for all the length they carry us, because they do not enable us to know all things, or even any one thing in all of its relations. This can be made plain by a thousand illustrations. It casts no doubt upon the truthfulness of our sight when we find that beyond the violet of the solar spectrum there are innumerable rays invisible to us. It casts no doubt on the truthfulness of the intimations given to us by our olfactory nerves because they do not tell us all that a dog is told by its homologous apparatus. Our faculties have a certain range, within which it is given to us to keep pace with truth, and beyond which we must be con-

tent to feel that at least we can look straight on in the true direction. The fact is that our sense of limitation is, in one aspect, among the very noblest of our mental characteristics. It could not possibly exist if the faculties which give us that sense of limitation were wholly incapable of overpassing it. They feel the cage only because they press against its bars. Our sense of limitation does not indicate a line where our faculties cease to be, but only a line where opportunity ceases to be open to them. It is a dim seeing of the invisible—a dim touching of the intangible. It is a sense full of immortality.

But there is another temptation acting upon us in respect to our understanding of Truth which is worse than the temptation to let it go because we cannot follow it far enough. And that is the temptation to think of it as unimportant, either generally, or in some particular fields of thought. This is a worse temptation than any other, because it implies a complete sacrifice of the very conception of that in which Truth consists. If it consists in the conformity of our ideas with an external order, then it is impossible that any departure from that conformity can be unimportant. If the Cosmos is an Order, as everything proclaims it to be, any element of disorder must be an alien element—a diverging line of movement—leading to ever wider and wider departure from its harmonious and perfect continuities. Let me warn

you earnestly against this error, because, more or less veiled, you will meet with it constantly, and sometimes in high places. Thus, quite recently, you may have seen an example in the writings of a very eminent man, who is a great teacher in physical science —whose works upon his own subjects I always read for instruction, and whose contendings upon other subjects I generally read for warning. "No man can doubt," says Professor Huxley, in a recent article,* "the enormous value of trust and faith; but as little will he be inclined to deny that this practical value has not the least relation to the reality of the objects of that trust and faith." This amounts to an assertion that in the very highest matters of human knowledge, or speculation, or belief, Truth is a matter of complete indifference and that Untruth may have exactly the same value and results. This, again, really involves the proposition that there is no such a thing as Truth, as we have seen it to be definable. This alleged indifference of consequences between Truth and Untruth—between conformity with or departure from the external order of the vast system in which we live, is a doctrine of complete intellectual anarchy. The whole analogies of Nature, as these are most certainly known to us, are against this doctrine. The continuities of error are as certain and inevitable as the continuities of truth. Men will

* *Nineteenth Century*, Feb., 1889, p. 171.

never gather grapes of thorns, or figs of thistles. The same fountain will never send forth both sweet and bitter waters.

But whilst this doctrine of continuity in and between all regions of Truth, rebukes and condemns all indifference to opinion and beliefs, even in the most abstract conceptions of the mind—it is at the same time the greatest of all encouragements to those who work, however humbly, in any of the fields of knowledge. There is not one of these fields, however small it may seem in the maps of science, from which you may not ascend to the very highest generalizations. This is no mere theory. It has been so—over and over again in the history of science, and in the lives of her greatest masters. Two of our Poets have given expression to this truth—one in the region of the moral sentiments, the other in the region of purely intellectual investigation. We all know the lines of Wordsworth—

> To me the meanest flower that blows can give
> Thoughts that do often lie too deep for tears.

Tennyson, in lines perhaps less widely noticed, but as profoundly true, has expressed the same truth in the region of purely intellectual research—

> Flower in the crannied wall,
> I pluck you out of the crannies;—
> Hold you here, root and all, in my hand,

> Little flower—but if I could understand
> What you are, root and all, and all in all,
> I should know what God and man is.

This is a great thing for us all to remember. Many of you whom I have now the honor to address are soon to go out of your academic halls into the active business of life. With some of you, as especially with the large number who are about to enter the medical profession, that ordinary business of life must bring you into daily contact with the profoundest mysteries of Nature—namely, those in which mind and matter are combined in the bodily frame of man. With others the position may be less favorable either for discovery or meditation in the domain of Nature. But there is one part of Nature which is always near you, and that is your own selves, and your brother men. We live in an age when there is a general tendency to loose speculation on the deepest subjects—to take nothing for granted, and to place little value on the historical developments of society. Well, be it so. But if you adopt as your motto, "Prove all things," pray remember the sequel of it, "Hold fast that which is good." Remember that the cause of Truth may call you not always to the establishment of ideas which are new, but sometimes to the defence of ideas which are old. We may believe in the general progress of the world. But not even the most optimistic can believe that it has been, or ever will be, uninterrupted and continuous.

Forward then, but still remember how the course of time will swerve,
Crook, and turn upon itself, in many a backward streaming curve.

There are some questions in philosophy—and these the most important of all—on which, apart from religious belief, it is well open to serious doubt whether one single step of progress has been made. I confess that when I read certain passages in the old writers of Greece and Rome, I cannot help feeling that their reasoning is infinitely more close and cogent than that with which we are familiar in our own day. It is really refreshing to turn to them from the confused and empty phrases, such as "natural selection" and "survival of the fittest," and many others of the same class, with which we cheat ourselves and others into a belief that we are expressing some profound and far-reaching truth. What, for example, can be more grand and simple than this passage from Cicero:—"No man should be so madly presumptuous as to believe that he has either Reason or Intelligence while he does not believe that the heaven and the world possess them likewise; or to think that those things which he can scarcely comprehend, by the greatest possible exertion of his intellect, are put in motion without the agency of Reason"?* These are weighty words, indeed.

*"De Legibus," B. 2, Sec. vii.

Every step in the progress of science has been accumulating evidence on evidence to show how true they are. In the days of Cicero the physical sciences did not exist. Their very methods were unknown. Yet the mere general aspects of Nature, and especially the visible movements of the heavenly bodies, were enough to impress upon those old cultured minds, as the most certain of all conclusions, the mental character of the Cosmos. This is the secret of that intense delight and absorbing interest which many men experience in the investigation of some little scrap and fragment of the natural world—finding in it, as they always do, the inexhaustible riches of Intellect and of Will. In its religious aspect, it explains that wonderful exclamation in the Psalms:—"How precious also are Thy thoughts to me, O God! how great is the sum of them!" * All that we have come to know since the days of Cicero has been gained by increasing experience of the intelligibility of Nature. Energies in matter which have intelligible properties; a fixedness in these properties which has an intelligible necessity; combinations of energy which show an intelligible subordination; and those kinds of combination which are directed by reasonable methods to the attainment of reasonable ends—such are always the highest results of both physical and metaphysical analysis. It is a result which ought to in-

* Ps. cxxxix. 17.

spire us with an intense appreciation of the dignity of Truth, and an abiding sense of the responsibility involved in the right use of Reason. It cannot be otherwise than a noble ambition to bring our thoughts into harmony with the thoughts of the Universal Mind.

Let us educate ourselves up to that high standard in the love of Truth under which we hate and disdain an intellectual fallacy as much as we hate and disdain a common lie. This is a very high and a very rare condition of mind; and yet it is the only reasonable condition. For indeed, the fallacy may be far more mischievous and far more dangerous than the lie. A false assertion on a matter of fact may be, and generally is, of temporary import. A false opinion may be, and continually is, the fatal heritage of many generations, or the sacrifice, perhaps for some long future, of all that past generations had gained for us. Value, then, very highly, Gentlemen, the integrity of your minds. When you see or hear a fallacy—even though it be used in the service of some cause to which you are attached, never take advantage of it in argument—nay more, never fail to disclaim it when you hear it used by others. If you do this you will have enough work before you. Never have fallacies been more rife than at the present time. Never has even the conscious employment of them been so lightly judged. The love of Truth in

this high sense is, I repeat it, the rarest and the noblest of all human gifts. Cherish it as such. It will not diminish that just humility which we ought all to feel in the conscious presence of the Unseen. Neither will it diminish your respect for legitimate authority, because legitimate authority—in its proper sphere—is one of the best and most needed of all our guides to Truth. But it will inspire us with the sense of our responsibility and of our stewardship in the use of Reason. It will fit us in a thousand ways to help the progress of our race, hoping always, at last, to hear the Master's voice, "Well done, good and faithful servant—Well done."

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